

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A computer-implemented method of designing a ~~routing element, wherein the routing element connects a plurality of~~ wiring structure, the wiring structure including at least one wiring element connecting a plurality of components in a system, the method comprising:
 - ~~establishing a system design~~ designing the wiring structure, the designing including identifying the plurality of components and establishing connections between the identified plurality of components by the at least one wiring element;
 - ~~generating a diagram associated with of the wiring structure system-~~ design, wherein the diagram indicates illustrating a routing pattern of the at least one wiring element and the connections between the plurality of components of the plurality of components in the system;
 - ~~establishing receiving~~ guidelines for designing the wiring structure, the guidelines including routing element-based on physical restrictions imposed on the wiring structure by a system into which the wiring structure is to be incorporated constraints of the routing element, the guidelines including recommendations for designing the routing element; and
 - automatically modifying the wiring structure design using the received guidelines and the diagram, the modifying including adjusting the routing pattern of the at least one wiring element according to the imposed physical restrictions; and
 - creating the wiring structure using the modified wiring structure design

~~automatically designing a routing pattern for the routing element based on the diagram and the guidelines.~~

2. (Currently amended) The method of claim 1, wherein ~~the routing element includes one or more connecting elements and wherein designing the routing element~~ the wiring structure further includes:

~~determining one or more~~ identifying multiple sets of one or more ~~connecting elements~~ wiring elements that can be bundled; and
determining a layout for each identified bundle within the ~~routing element~~ wiring structure.

3. (Currently amended) The method of claim 1, further including:

receiving one or more revised guidelines for designing the wiring structure ~~routing element~~; and

~~determining a revised design~~ automatically readjusting the routing pattern of the at least one wiring element ~~for the routing element~~ based on the ~~diagram and the revised guidelines~~.

4. (Currently amended) The method of claim 1, further including~~[[:]]~~ providing a drawing illustrating the wiring structure ~~system and a design for the routing element~~.

5. - 6. (Cancelled)

7. (Currently amended) The method of claim 1, further including~~[[:]]~~ automatically providing information about the ~~system~~ wiring structure design.

8. (Currently amended) The method of claim 7, wherein ~~automatically providing the~~ information includes: ~~providing~~ at least one of ~~[[:]]~~ a three-dimensional drawing of the wiring structure design, system; a two-dimensional drawing of the wiring structure design, system; a list of components ~~[[:]]~~, and a bill of materials associated with the wiring structure design ~~at least one of the system, the routing element, and the components.~~
9. (Currently amended) The method of claim 1, wherein the ~~routing element~~ wiring structure includes a wiring harness.
10. (Currently amended) A computer-readable medium including instructions ~~for performing a method, which,~~ when executed by a computer processor, causes the computer to perform a method of designing designs a wiring structure, the wiring structure including at least one wiring element connecting a plurality of components ~~for routing a plurality of elements for connecting components, the method comprising the steps of:~~
 - ~~establishing a system design~~ designing the wiring structure, the designing including identifying the plurality of components and establishing connections between the identified [[a]] plurality of components by the at least one wiring element;
 - ~~generating a diagram associated with of the system wiring structure design, wherein the diagram includes illustrating a routing pattern of the at least one wiring element and the connections between the plurality of elements and the plurality of components;~~
 - ~~accessing guidelines for designing the wiring structure, the guidelines including being based on physical constraints~~ restrictions imposed on the wiring structure by a system into which the wiring structure is to be incorporated of the plurality of elements and including recommendations for routing the elements in the structure; and

automatically modifying the wiring structure design using the received guidelines and the diagram, the modifying including adjusting the routing pattern of the at least one wiring element according to the imposed physical restrictions;

creating the wiring structure using the adjusted wiring structure design;
and

generating a bill of materials for the wiring structure based on the modified wiring structure design

~~automatically determining routing patterns in the structure for the plurality of elements based on the diagram and the guidelines.~~

11. (Currently amended) The computer-readable medium of claim 10, wherein the method further includes ~~wherein the step of determining routing patterns includes the steps of:~~

~~determining~~ identifying one or more multiple sets of one or more elements wiring elements that can be bundled; and

determining a routing pattern in the wiring structure for each identified bundle.

12. (Currently amended) The computer-readable medium of claim 10, wherein the method further includes ~~further including the steps of:~~

receiving one or more revised guidelines for designing the wiring structure;
and

~~determining a revised routing pattern~~ automatically readjusting the routing pattern of the at least one element in the structure for the plurality of elements based on the ~~diagram and the~~ revised guidelines.

13. (Currently amended) The computer-readable medium of claim 10, wherein the method further including: includes providing a schematic illustrating the wiring structure ~~and the determined routing patterns.~~
14. (Currently amended) The computer-readable medium of claim 10, wherein the ~~step of accessing~~ guidelines are determined according to ~~for designing the structure includes the step of: accessing~~ standards associated with the system design.
15. (Cancelled)
16. (Currently amended) The computer-readable medium of claim 10, wherein the method further includes ~~including the step of:~~ automatically providing information about the wiring structure design ~~designed structure.~~
17. (Currently amended) The computer-readable medium of claim 10, wherein ~~the step of~~ automatically providing information includes ~~the step of~~ providing at least one of~~[[:]]~~ a three-dimensional drawing of the wiring structure design,~~[[:]]~~ a two-dimensional drawing of the wiring structure design,~~[[:]]~~ and a list of elements and components; ~~and a bill of materials.~~
18. (Currently amended) The computer-readable medium of claim 10, wherein the wiring structure includes a wiring harness ~~and the elements include wires.~~
19. (Currently amended) A computer-implemented tool for designing a wiring structure, the wiring structure including at least one wiring element connecting a plurality of routing element, ~~wherein the routing element connects a plurality of components in a system via connecting elements~~, the tool comprising:
 - a processor; and
 - a computer-readable memory, including ~~wherein the memory includes:~~

a computer-aided design module that, when executed by the processor[[.]]:

~~establishes a system design~~ receives input of a design for the wiring structure, the design identifying the plurality of components and establishing connections between the identified plurality of components by the at least one wiring element, and

generates a diagram of the wiring structure design associated with the system design, wherein the diagram indicates illustrating a routing pattern of the at least one wiring element and the connections between of the plurality of components in the system; and

a design module that, when executed by the processor[[.]]:

~~designs a routing pattern for the routing element based on~~ accesses one or more guidelines for designing the wiring structure, the guidelines being based on including physical restrictions imposed on the wiring structure by a system into which the wiring structure is to be incorporated constraints of the routing element and including at least one recommendation for routing the connecting elements in the system, and

automatically modifies the wiring structure
design using the accessed guidelines
and the diagram, the modifying including
adjusting the routing pattern of the at
least one wiring element according the
imposed physical restrictions,

receives a revision of the one or more
guidelines for designing the wiring
structure, and

automatically readjusts the routing pattern of
the at least one wiring element based on
the revision

~~automatically determines routing patterns in~~
~~the system for the element based on the~~
~~diagram and the guidelines.~~

20. (Previously presented) The tool of claim 19, wherein the design module is software designed to work with the computer-aided design module.

21. (Currently amended) A tool for designing a wiring structure, the wiring structure including at least one wiring element connecting ~~routing element, wherein the routing element connects~~ a plurality of components ~~in a system~~, the tool comprising:

a routing design module embodied in computer-readable memory
configured to ~~perform the following steps:~~

~~establishing a system~~ receive a design for the wiring
structure, the design identifying the plurality of
components and establishing connections between
the identified plurality of components by the at least

~~one wiring element including the plurality of components;~~

~~generating generate a diagram of the wiring structure design associated with the system design, wherein the diagram illustrating a routing pattern of the at least one wiring element and the indicates connections of between the plurality of components in the system;~~

~~establishing accessing guidelines for designing the routing-element wiring structure, the guidelines including physical restrictions imposed on the wiring structure by a system into which the wiring structure is to be incorporated at least one recommendation for designing the routing the element; and~~

~~automatically modifying the wiring structure design using the received guidelines and the diagram, the modifying including adjusting the routing pattern of the at least one wiring element according to the imposed physical restrictions; and~~

~~generating a bill of materials for the wiring structure based on the modified wiring structure design designing a pattern for the routing element based on the diagram and the guidelines.~~

22. (Currently amended) A computer-implemented method of designing a wiring structure, the wiring structure including at least one wiring element connecting a plurality of components ~~routing an element among to connect a plurality of components in a system~~, the method comprising:

establishing receiving a design for the wiring structure, the design
identifying the plurality of components, establishing connections

between the plurality of components by the at least one wiring element, and establishing a routing pattern of the at least one wiring element to be connected;

establishing receiving routing guidelines for designing the wiring structure, the guidelines including based on physical constraints restrictions imposed on the wiring structure by a system into which the wiring structure is to be incorporated of the element and including at least one recommendation for routing the element in the system; and

automatically modifying the wiring structure design using the received guidelines, the modifying including adjusting the routing pattern of the at least one wiring element according to the imposed physical restrictions;

creating a bill of materials for the wiring structure based on the modified wiring structure design; and

creating the wiring structure based on the modified wiring structure design
~~automatically determining a routing pattern for of the element to connect the plurality of components based on the routing guidelines.~~

23. (Cancelled)

24. (Currently amended) The method of claim 1, wherein ~~establishing guidelines for designing the routing element includes establishing the guidelines~~ are determined by prompting a user to answer one or more questions.

25. (Currently amended) The tool of claim 21, wherein ~~establishing guidelines for designing the routing element includes accessing the guidelines~~ are stored in ~~from~~ a centralized location.

26. (Cancelled)

27. (Currently amended) A computer-implemented method for designing a wiring structure, the wiring structure including at least one wiring element connecting routing element that connects a plurality of components in a system, the method comprising:

establishing receiving a design for the wiring structure, wherein the design identifies the plurality of components and establishes connections between the plurality of components by the at least one wiring element ~~a list of components and connections among the components;~~

generating a diagram of the wiring structure design system based on the list, the diagram illustrating the plurality of components, and the connections between the plurality of components by the at least one wiring element, and a routing pattern of the at least one wiring element;

establishing accessing guidelines for designing the routing element wiring structure based on physical constraints of the routing element, the guidelines including physical restrictions imposed on the wiring structure by a system into which the wiring structure is to be incorporated ~~information reflecting a geometry of the system; and~~

automatically modifying the wiring structure design using the accessed guidelines, the modifying including adjusting the routing pattern of the at least one wiring element according to the imposed physical restrictions;

receiving at least one revision of the guidelines; and

automatically readjusting the routing pattern of the at least one wiring element based on the at least one revision of the guidelines

automatically designing a routing pattern for the routing element based on the diagram and the guidelines.

28. (Cancelled)